REMARKS

Claims 1-3, 6, 7, 9, 12-17, and 42-50 are pending in the application. New claims 51-54 have been added to the application. Therefore, claims 1-3, 6, 7, 9, 12-17, and 42-54 are at issue.

The courteous interview granted by Examiner Patterson to applicant's undersigned attorney on June 12, 2007 is hereby acknowledged with appreciation. During the interview, the Office Action, claims, and cited references were discussed in detail. In addition, proposed amendments to the claims were discussed, and in particular reciting to a nylon that include only amines and carboxylic acids, or functional equivalents thereof.

Claims 1 and 42 have been amended to clarify that the claimed nylon consists of one or more aliphatic primary amine and one or more aliphatic dicarboxylic acid, or functional equivalents thereof, i.e., an omega-aminocarboxylic acid and an omega-aminocarboxylic lactam. Support for these amendments can be found in the specification at page 6, lines 26 through page 7, line 4.

Claim 9 has been amended to improve the form of the claim. Claim 46 has been amended to clarify the amount of polyvinylpyrrolidone in the nylon layer. Claims 49 and 50 have been amended to correct a previously incorrect claim, i.e., the specification teaches that the liquid is absorbed *up to* a depth of about one-half of the thickness of the layer, or *up to* about 5 microns. Support for this amendment is found throughout the specification, including Figs. 3-6. Also see specification, page 24, lines 10-16.

New claims 51-54 are supported in the specification at Table 2, page 17; Table 3, page 18; Table 4, page 19; and page 24, lines 14-16, for example.

The present claims now recite a nylon film consisting only of monomers that provide amide linkages, i.e., a polyamide. Such films are known in the art as hydrophobic films (see cited WO 97/36798) and are incapable of absorbing useful amounts of aqueous liquids. Applicant has found, unexpectedly, that by subjecting the film to a high amount of total energy, this high amount of total applied energy provides more than a mere surface activation, but actually *permanently* changes the morphology of the nylon film. This change

allows a previously hydrophobic nylon film to absorb increased amounts of an aqueous liquid, *without* the presence of a hydrophilic comonomer in the film.

The permanent change in nylon film morphology is clearly shown in Figs. 3-6 and Example 4. The portion of the specification shows that an aqueous solution was not merely coated on the surface of the film, but had been absorbed well into the film. Importantly, about one half of the film structure had been modified in permanent way, such that even after the aqueous liquid was extracted from the film, the modified structure *still remained* i.e., is permanent.

The fact that the nylon film structure had been permanently changed was a surprising result, that could not be predicted from any known prior art, including the cited references. As disclosed in cited WO 97/36798, corona treatment is used to modify the surface character of a film to promote meat adhesion. All other prior art of which applicant is aware also teaches that corona treatment is merely a surface modification, and it is well known that this surface modification can be removed by wiping with brushes or a cloth. This is a common practice after printing on a film to prevent the film layers from adhering to one another. There is no known art teaching that a corona or similar energy treatment permanently alters or modifies the structure of a polymer to a depth of about 5 microns.

The application of a high total level of energy to a nylon film to arrive at the present invention is disclosed in the specification at page 17, lines 16-22, stating:

> "In the experiments it was observed that the surface activation was so high, that the dyne level was outside of the usual dyne measurement techniques. For this reason in future tests the level of surface activation was estimated in terms of watt density.
>
> Watt density is calculated according to the following formula:
>
> $$\text{Watt density} = \frac{\text{power supply (watts)}}{\text{Width of tube(M)} \times \text{line speed min/M)}}$$

It is important to note that w-min/m2 is *not* a measure of surface activation, but is a measure of the total energy that is absorbed by the film.

Applicants, in this passage from the specification, and as recited in new claims 51-53, show that the units "w-min/m2" is an appropriate measure of *the total energy that has been applied to the nylon film*. The dyne test was used, and claimed as in indirect, minimum measure of the amount of energy being absorbed. Also see specification, page 18, line 26 through page 19, line 2, wherein it is stated that at a dyne level of 70 or higher, the dyne test cannot be used with any reliability. For this reason, the applied energy levels in the examples are presented as watt density because the dyne level was too high to accurately measure.

It also should be noted that in order to achieve the high levels of energy required to achieve the benefits of the presently claimed invention, applicant utilized a specially prepared, highly powered corona treatment device, i.e., having a power greatly exceeding that of commercially available devices. In fact, the designers of the corona treatment device were concerned that, at such high power levels, the film would be destroyed, as opposed to improved. However, the very high energy levels applied actually resulted in an increased amount of liquid absorbing into the film. This was proven by the photomicrographs in Figs. 3-6 and in the Tables of the specification, and was highly unexpected.

Claim 50 stands rejected under 35 U.S.C. §112, first paragraph, for failing to comply with the written description requirement because of the recitation of "5 mm". Applicants apologize for this inadvertent typographical error and have amended claim 50 to recite "5 microns". Support for this amendment can be found in the specification at page 24, lines 10-14. Accordingly, it is submitted that this rejection under 35 U.S.C. §112, first paragraph, has been overcome and should be withdrawn.

Claim 46 stand rejected under 35 U.S.C. §112, second paragraph, as being indefinite for failing to clearly recite the meaning of "16%". In response, applicants have amended claim 46 to recite "16%, by weight". Accordingly, it is submitted that the rejection of claim 46 under 35 U.S.C. §112, second paragraph, has been overcome and should be withdrawn.

Claims 1-3, 7, 9, 12-15, 17, 42-44, and 46-50 stand rejected under 35 U.S.C. §102(b) as being anticipated by WO 97/36798 (WO '798). Claims 6 and 45 stand rejected

under 35 U.S.C. §103 over WO '798. Claim 16 stands rejected under 35 U.S.C. §103 over WO '798 in view of EP 0 986 957 (EP '957). For the reasons set forth below, it is submitted that these rejections should be withdrawn. It also is submitted that new claims 51-54 are patentable over the cited WO '798 and EP '957.

A presently claimed nylon film differs substantially from a block copolymer film of WO '798, thereby precluding a rejection under 35 U.S.C. §102(b) and under 35 U.S.C. §103. Importantly, the present claims now claim a nylon having *only* amide units, i.e., to a polyamide *only*, and excluding other monomer and blocks of monomers from the nylon. Applicants also specifically wish to direct the examiner's attention to Example 4 at page 24 of the specification and the accompanying SEM micrographs in Figures 3-6, and particularly Figure 4. Example 4 and the SEM micrographs explicitly demonstrate that a coating composition of Example 1 (i.e., C7) was not merely coated on the inner layer, but had been *absorbed* into the inner layer. Most importantly, the innermost 50% of the inner layer structure of the nylon had been modified *permanently*. This permanent modification converted the hydrophobic nylon film into a film that is capable of absorbing aqueous liquids, which is both new and unexpected in the art.

In particular, after the coating composition was extracted from the inner layer, the modified nylon structure still remained. As stated in the specification at page 24, lines 10-16:

> "Initial results showed that the principal difference between untreated and absorbed film was that a 10 micron thick porous inner layer with irregular surface morphology was changed into a 5 micron thick porous layer and a 5 micron thick nonporous innermost layer with irregular surface morphology. This indicated that the composition had absorbed into the inner film layer and impregnated the inner layer to a depth of about ½ the original thickness."

Claims 49, 50, and 54 recite this feature.

With respect to the corona treatment disclosed in WO '798, a person skilled in the art would not have been motivated to surface treat a claimed nylon film to the extent

presently claimed after reading WO '798. Corona treatment is discussed in WO '798 at page 13, lines 1-21 stating (emphasis added):

> "To assist in reducing or eliminating cook-out, a food-contact layer having a surface energy of greater than 34 dynes/cm, preferably greater than 46 dynes/cm, and most preferably greater than 50 dynes/cm is preferred. At such surface energies, the food-contact layer is *believed to provide sufficient adhesion with the food product to prevent or substantially minimize cook-out*.
>
> If the film *adheres so strongly* to the cooked food product such that it cannot be peeled therefrom without tearing away portions of the same, the copolymer of the food-contact layer can be blended with one or more polymers that lower its adhesion. In this regard, less polar polymers such as polyolefins having a surface energy of about 36 dynes/cm or less can provide beneficial results. On the other hand, *if adhesion* between the film article and food product *is too low*, the surface energy of the food-contact layer can be increased. This can be accomplished by, for example, subjecting the surface of the food-contact layer to sufficient energetic radiation (i.e., of sufficiently high intensity or for a sufficiently long period of time) to achieve a desired increase in surface energy. Examples of radiative techniques include plasma and corona treatments. Alternatively, the surface energy of the food-contact layer can be increased by including one or more polar additives such as polyesters, polyamides, polylactic acid, and polar polyolefins such as ethylene/unsaturated acid copolymers, modified polyolefins, and blends thereof."

The first paragraph of this excerpt refers to a surface modification that does not contemplate a nylon film as presently claimed, i.e., subjected to high total energy levels such that the hydrophobic nylon film is permanently changed and can *absorb* a liquid. The second paragraph teaches blending in a polyolefin to reduce surface energy, or increasing surface energy of the *block copolymer* disclosed in WO '798 by plasma or corona treatment. Importantly, WO '798 states that "[A]lternatively, the surface energy...can be increased by including...polyamides..." Accordingly, WO '798 does *not* teach surface treating a polyamide, but rather adding a polyamide to the block copolymer to increase surface energy, if necessary.

This disclosure in WO '798 supports the present disclosure at page 8, lines 26-30 of the specification stating:

> "Polyamide casing materials which have a surface energy in the order of up to about 45 dynes generally have sufficient meat adherent properties and corona treatment is not required. It is believed that if a polyamide was corona treated, the resulting film would adhere excessively to a meat surface, causing the above-mentioned problems."

Although WO '798 may disclose that the block copolymer disclosed in the reference can have a surface energy of greater than 50 dynes, the above *explicit* disclosure of WO '798 clearly teaches that the surface energy of a *polyamide* should *not exceed* 45 dynes. It is submitted, therefore, that WO '798 fails to teach or suggest a high total energy surface treatment of a hydrophobic polyamide, or to provide a nylon film consisting of amide groups *only*, as claimed, which is permanently altered in structure and capable of absorbing liquids.

With respect to the rejection of claims 1-3, the examiner states that WO '798 discloses a film having a liquid absorbed therein, wherein the surface of the film can have a surface energy of at least 50 dynes. The examiner also states that the feature of corona treatment and liquid application are to be given little patentable weight because the limitations are directed towards a process limitation. As discussed below, applicants traverse this contention because the claimed features are *not* directed to a process limitation, but to features of the nylon film.

WO '798 discloses a film formed from a *block copolymer* having a substantially water-insoluble segment and a substantially hygroscopic segment (see WO '798 abstract, page 3, lines 27-30, and page 4, lines 11-13 and 17-18, for example). The hygroscopic segment is formed from a coreactant capable of homopolymerizing to provide a material that is substantially hygroscopic. See WO '709, page 8, lines 3-15. The hygroscopic segments retain an aqueous modifier, or additive, that is transferred to a food product (WO '798, page 8, lines 16-19). The water-insoluble segment does *not* dissolve or absorb the aqueous modifier, rather its purpose is to provide structural integrity to the film such that the film remains intact upon separation from a food product (WO '798 page 8, line 27 through page 9, line 2). In other words, WO '798 discloses a polymer having structural segments

(water insoluble) and absorbing segments (hygroscopic). The water insoluble segments preferably are a *derived* from an amide, for example (WO '798, page 9, lines 24-29). The hygroscopic segments are different from a nylon, as set forth in WO '798 at page 10, lines 10-26.

WO '798 specifically discusses the purpose of the hygroscopic blocks, i.e. (1) in the following paragraph, and the hydrophobic blocks, i.e., (2) in the following paragraph at page 9, lines 3-7 of WO '798:

> "Thus, a copolymer including both water-insoluble and hygroscopic segments advantageously (1) allows for sorption and subsequent transfer (to a food product during cook-in) of a modifier, and (2) remains intact (or at least substantially intact) so that the food-contact layer can be separated from the food product at any desired time after cooking."

The present claims recite a *nylon* film, which is substantially different from the block copolymer of WO '798. The block copolymer of WO '798 *requires* a hydrophobic block (e.g., nylon) and a hydrophilic block (e.g., WO '798, page 10, lines 10-26). The present claims recite a nylon consisting of the amide forming monomers recited in the claims. The claimed nylon therefore which *by definition* contains only repeating amide units and is substantially different from a block copolymer as disclosed *and* required by WO '798.

On this basis alone WO '798 cannot anticipate the present claims. However, the present claims also recite that the amount of liquid absorbed by a nylon film having a surface dyne level of at least about 50 dyne and/or a watt density of at least about 50 w-min/m^2 absorbs more liquid than a nylon film surface that has not been surface activated. Contrary to the examiner's contentions, this *functional* language in the claims has patentable weight and is not directed to a process limitation. This feature of the claims further distinguishes the present claims from WO '798 and is supported by Table 2, page 17 of the specification showing a 15% and 67.5% increase in absorbed liquid after application of high amount of energy to the nylon film. Also see Tables 3-5 of the specification for additional supporting data.

It is well known the functional language is permissible in claims. See M.P.E.P. §2173.05(g). In particular, functional language is permissible, as long as definite boundaries are set, and often is used when a physical or chemical change or property cannot be adequately described, or is not known, but the effects of the physical or chemical change or property is known and can be claimed. In such a case, there is no other way for an applicant to claim his invention.

In the case at bar, the claims recite a surface-activated nylon film, wherein a surface of the nylon film has a dyne level of at least about 50 dynes and/or a watt density of at least about 50 w-min/m^2. Furthermore, the surface activated nylon film has an ability to absorb more liquid than the nylon prior to surface activation. These features recited in the claims *are not* process limitations. The features define the nylon film and the properties of the nylon film, in a manner that fully complies with 35 U.S.C. §112.

WO '798 not only fails to teach or suggest a nylon film as presently claimed, but also fails to teach or suggest *any* significant modification of physical properties of the *water-insoluble* segment of the block copolymer to enable this segment to absorb a liquid because such modification *would decrease* the structural integrity of the water-insoluble segment and potentially lead to failure of the film. In fact, WO '798 discourages modification of the physical properties of the water-insoluble segment, which is present in WO '798 to provide structural integrity.

WO '798 refers to using corona treatment to increase the surface energy of the food contact layer (page 13, lines 1-6). This increase in surface energy is provided solely to increase adhesion between the film and the food product, thereby reducing undesirable purge or cookout. WO '798 also teaches that the surface energy can be increased by adding a polar additive, such as a polyamide. WO '798 further teaches that when the food contact layer is PEBA (poly(ether block amide)), then corona treatment is not required. Still further, it is noted that WO '798 also *cautions against* the surface activity of a film being too high because this will lead to tearing of the product upon film removal (page 13, lines 7-8). It should be noted that the present claims recite a surface energy of *at least* 50 dynes, which WO '798 discourages. WO '798 fails to teach or suggest the application of sufficient energy to provide a watt density of at least 50 w-min/m^2.

WO '798 absolutely fails to teach or suggest, and fails to consider or address, that surface activation can increase the ability of a *hydrophobic nylon* to absorb a liquid. In fact, the disclosure of WO '798 leads to a contrary conclusion. WO '798 teaches that (1) the presence of a water-soluble segment is *essential* for the film to absorb a liquid and (2) the water-insoluble segment does not absorb liquid but provides structural support. WO '798 merely suggests the possible use of a corona treatment in accordance with *conventional* corona treatments used in the industry to increase surface adhesion of polyolefin films. Such conventional use is acknowledged in the present specification. Applicant submits that a person of skill in the art would therefore understand the reference to corona treatment in WO '798 to refer to the instance when the water-insoluble segment is an olefin. Still further, it is noted that exemplified films in WO '798 are *not* corona treated, or otherwise surface activated.

Applicant, therefore, submits that a nylon consisting only of amide linkages, which has undergone *sufficient* surface treatment, e.g., to *at least* about 50 dynes or *at least* about 50 w-min/m^2, and has an increased ability to absorb a liquid, must be physically and/or chemically different from a nylon that is not surface activated, and different from the segmented-film disclosed in WO '798. It is not incumbent upon the applicant to define, or even theorize, as to what the difference is, but can rely upon claiming the improved properties demonstrated by the surface activated nylon film.

To summarize the differences between the present claims and WO '798, the independent claims have been amended to recite that the film is a nylon containing only amide linkages, such a polyamide clearly excludes the block copolymers disclosed in WO '798, and that surface activation using a sufficiently high amount of energy (which those in the art considered detrimental) actually increases the amount of liquid that can be absorbed by the permanently altered film. These features are neither taught nor suggested by WO '798, which precludes a novelty rejection under 35 U.S.C. §102(b). Because dependent claims 2, 3, 6, 7, 9, 12-17, 43, 44, and 46-50 each incorporate the features of the independent claims, these claims also are novel over WO '798. It also is submitted that these are nonobvious differences over WO '798, and that claims 1-3, 6, 7, 9, 12-17, 42-44, and 46-50, and new claims 51-54, are patentable over WO '798 under 35 U.S.C. §103.

With respect to claim 9, this claim recites a *blend* of nylon and polyvinylpyrollidone (as opposed to a segmented copolymer). See specification page 16, lines 4 and 5. This is different from the copolymer of WO '798. Applicant respectfully points out that the reference at page 11 of WO '798 refers to crosslinking of *HPC* (hydroxypropyl cellulose) to render it water insoluble. There is no disclosure in WO '798 with respect to crosslinked polyvinylpyrollidone. Polyvinylpyrollidone is described in WO '798 as being a useful moisture absorbing polymer to be blended with the copolymer. Applicant submits that a person of skill in the art would understand that crosslinking of polyvinylpyrollidone would be *un*desirable in view of the disclosure of WO '798 because crosslinking *reduces* the moisture-absorbing capabilities of the polyvinylpyrollidone.

With further respect to claims 14, 15, and 17, and reference to an antiviral agent, applicant respectfully submits that the claim is being construed more broadly than is permissible. During examination, claims are interpreted as broadly as their terms reasonably allow. *In re American Academy of Science Tech Center*, 367 F.3d 1359, 1369, 70 USPQ2d 1827, 1834 (Fed. Cir. 2004). The words of the claim must be given their plain meaning unless applicant has provided a clear definition in the specification. It is submitted that to construe the term antiviral to extend to an agent which has no inherent antiviral properties, but simply induces eating, goes beyond the plain meaning of the term. Many agents that induce eating are *not* antiviral compounds, e.g., sugar or salt.

It also must be pointed out that an ingredient that "induces eating" does *not* preclude infection of a food product because food products, and especially those in films, are not consumed immediately after preparation, but can be stored, shipped, remain on store shelves, and in remain possession of the purchaser for a substantial time prior to the agent having an ability to "induce eating." Thus, the food product can be infected prior to or after an arguable inducement to eating occurs.

Claims 6, 7, 11-13, and 45 recite preferred embodiments of the invention, and do not rely solely on the features recited in these claims for patentability, but rely upon the claimed features and *all* of the features recited in claim 1. For the reasons set forth above with respect to claim 1, it is submitted that claims 6, 7, and 11-13 also are novel and nonobvious over WO '798.

Claim 16 stands rejected as being obvious over WO '798 in view of EP '957. The patentability of claim 16 over WO '798 has been discussed above. EP '957 fails to cure the deficiencies of WO '798. EP '957 merely discloses incorporation of a flavor component into a polysaccharide or protein binder for the transfer of the flavor to food. This teaches no more than WO '798, i.e., incorporating a flavor into a *hydrophilic* film for transfer to a food. Neither WO '798 nor EP '957 teach or suggest incorporating a flavor, for example, into a hydrophobic nylon as claimed, or providing a nylon having *sufficient* surface activation to increase the amount of liquid that the film can absorb. In fact, WO '798 specifically teaches that the nylon (hydrophobic) components of the block copolymer do *not* absorb liquids. Therefore, claim 16 is patentable over the combination of references for the same reasons set forth above with respect to claims 1-3, 6-17, and 42-48.

In summary, it is submitted that claims 1-3, 6-17, and 42-48 are both novel and nonobvious over WO '798 and EP '957, alone or in combination. WO '798 merely teaches a *block* copolymer wherein the hydrophobic blocks do not absorb liquids, and teaches optional surface activation of a film to avoid purge. WO '798 does not teach a polymer having only amide linkages, i.e., a polyamide as presently claimed. WO '798 fails to teach or suggest a *high* level of surface activation that improves the ability of a hydrophobic nylon to absorb a liquid, i.e., to increase the amount liquid that can be absorbed by the film. In fact, WO '798 provides no teaching or suggestion that the films disclosed therein have any ability to absorb an increased amount of liquids. EP '957 fails to cover the deficiencies of WO '798 for the reasons set forth above. It is further submitted that new claims 51-54 also are patentable over WO '798, alone or in combination with EP '957 for the reasons set forth above.

In the Office Action, the examiner set forth reasoning in an attempt to refute applicants' arguments in Amendment "A". Applicants now address this reasoning:

(a) the claims have been amended to exclude nylon containing copolymers, and WO '798 fails to teach or suggest a nylon as claimed, therefore rendering the examiner's comments as moot;

(b) applicants have previously addressed the erroneous contention in that various claim features are structural limitations having no patentable weight. The examiner states that it is not clear what is being claimed. However, the claims are quite clear. They are directed to a nylon film, as claimed, having an improved ability to absorb an aqueous liquid after a high energy treatment, compared to the same nylon prior to the high energy treatment.

(c) the examiner contends that the insoluble segment of the WO '798 copolymer absorbs liquids. WO '798 specifically teaches that the *hydrophilic* segment sorbs liquids and the hydrophobic segments provide structural integrity. See WO '798, page 8, line 3 through page 9, line 7. The examiner's statement is contrary to the explicit teachings of WO '798. A mixture containing cotton balls and steel balls can absorb a liquid, but the steel balls of that mixture do not.

(d) applicants prior arguments relating to corona treatment to increase adhesion between the film and food product are correct. Further WO '798 teaches that corona treatment is not necessary to increase surface energy, because this can be accomplished by adding a polyamide (WO '798, page 13, lines 18-21). From this teaching, a person skilled in the art would not be motivated to corona discharge treat a nylon, i.e., a polyamide, to increase surface energy. In view of the language of WO '798, i.e., "alternatively," at page 10, lines 17-21, it is clear that WO '798 does not teach corona treatment of a polyamide;

(e) WO '798 teaches a surface energy of 50 dynes, but this is for a copolymer. WO '798 fails to teach or suggest increasing the dyne level of a polyamide as claimed, and explicitly states that the dyne level of a *polyamide* must be 45 dynes or less. Rather, WO '798 teaches *adding* a polyamide to the film, see WO '798, page 13, lines 18-21.

(f) WO '798 fails to teach modification of the hydrophilic segments of the copolymer for the reasons set forth in (c). The examiner is incorrect in contending that the hydrophobic segment absorbs the modifier;

(g) arguments with respect to WO '798 failing to teach crosslinked polyvinylpyrollidones are presented above;

(h) the statement that "an ingredient that induces eating is therefore antiviral" has no basis in fact and absolutely falls on its face. Sugar induces eating and is not an antiviral agent. WO '798 fails to mention infecting a food product, which supports applicants' patentability position. Applicants are claiming that the liquid absorbed into the nylon can contain an agent that *protects against* microbial contamination. See present claim 17.

In summary, it is submitted that the claims are in a proper form and scope for allowance or, should the rejection be maintained, for immediate appeal. An early and favorable action on the merits is respectfully requested.

Should the examiner wish to discuss the foregoing, or any matter of form in an effort to advance this application toward allowance, the examiner is urged to telephone the undersigned at the indicated number.

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Respectfully submitted,

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